PERICENTRIC INVERSION FREQUENCY MEASURED BY FLUORESCENCE *IN SITU* HYBRIDIZATION

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Because energy of high-LET radiation is deposited in shorter tracks compared with low-LET radiation, arguments can be made for a radiation signature for high- and low-LET radiations based on the expected relative difference in the induction of intra- versus inter-chromosome exchange aberrations. That is, the ratio of dicentrics/rings and translocations/inversions is expected to be higher for high-LET radiation relative to the frequency for low-LET radiation. However, inversions are difficult to measure, and rings are unstable with time. Here, a method for measuring pericentric inversions is described. It employs fluorescent probes generated by microdissection and degenerative oligonucleotide priming. For a given chromosome, the first probe is specific to one telomere and the second is specific to a sub-centromeric region. A pericentric inversion is made distinct by the position change of the fluorescent signals relative to the chromosome centromere. When the two probes (green) were used in combination with a centromeric probe (red), pericentric inversions were easily scored based on an inverted color pattern change among the probes. We present data on measurements of translocations and inversions for both high- and low-LET radiations. (Work was performed under the auspices of the U.S. DOE by LLNL under contract no. W-7405-ENG-48.)